THE OHIO JOURNAL OF SCIENCE

VOL. XLI NOVEMBER, 1941 No. 6

ANNUAL REPORT

OF THE

OHIO ACADEMY OF SCIENCE

1941

THE OHIO ACADEMY OF SCIENCE

Organized 1891 Incorporated 1892

Affiliated with the American Association for the Advancement of Science

OFFICERS AND COMMITTEES FOR 1941-1942

President

EUGENE VAN CLEEF

Vice-Presidents

A. *Zoology:* J. PAUL VISSCHER
B. *Botany:* CLARENCE E. TAFT
C. *Geology:* GEORGE B. BARBOUR
D. *Medical Sciences:* PAUL C. KITCHIN
E. *Psychology:* HAROLD EDGERTON
F. *Physics and Astronomy:* R. S. SHANKLAND
G. *Geography:* A. J. Wright
H. *Chemistry:* WILLIAM MANUEL
I. *Mathematics:* C. O. WILLIAMSON
J. *Junior Academy:* C. W. JARVIS

Secretary

ARTHUR W. LINDSEY

Treasurer

EDWARD S. THOMAS

Executive Committee

Ex-Officio: EUGENE VAN CLEEF, ARTHUR W. LINDSEY AND EDWARD S. THOMAS
Elective: WM. LLOYD EVANS, ROBT. M. GEIST

Trustees of Research Fund

CHARLES G. SHATZER, term expires....1942
PAUL B. SEARS, term expires....1943
HERBERT OSBORN, *Chairman*, term expires....1944

Library Committee

MRS. ETHEL M. MILLER, *Chairman*,
Librarian in charge of Academy Exchanges and Publications
JAMES R. PATRICK, term expires....1942
FRANCIS E. RAY, term expires....1943

Committee on Conservation

A. E. WALLER, *Chairman*, term expires....1942
EMERY R. HAYHURST, term expires....1942
L. E. HICKS, term expires....1942
DWIGHT M. DELONG, term expires....1943
T. H. LANGLOIS, term expires....1943
J. D. SAYRE, term expires....1943
G. W. CONREY, term expires....1944
PAUL B. SEARS, term expires....1944
E. L. WICKLIFF, term expires....1944

Committee on Nominations for 1942

THE VICE-PRESIDENTS OF 1940–1941

Membership Committee for 1942

A. *Zoology:* ROBERT M. GEIST
B. *Botany:* CONSTANTINE J. ALEXOPOULOS
C. *Geology:* PARIS B. STOCKDALE
D. *Medical Sciences:* FRANK E. HAMILTON
E. *Psychology:* L. D. HARTSON
F. *Physics and Astronomy:* R. L. EDWARDS
G. *Geography:* RODERICK PEATTIE
H. *Chemistry:* PAUL ROTHEMUND
I. *Mathematics:* O. L. DUSTHEIMER
J. *Junior Academy:* J. W. BRANSON

Academy Representatives

(1) On Joint Administrative Board, O. J. S.: JAMES R. PATRICK, term expires 1942, and FRANCIS E. RAY, term expires 1943.
(2) On Council of the A. A. A. S.: WILLIAM H. ALEXANDER.
(3) On Save Outdoor Ohio Council: ROSCOE W. FRANKS.

The Council for 1941–1942

ALEXANDER, WILLIAM H.
ALEXOPOULOS, CONSTANTINE J.
BARBOUR, GEORGE B.
BRANSON, J. W.
DUSTHEIMER, O. L.
EDGERTON, HAROLD
EDWARDS, R. L.
EVANS, WILLIAM LLOYD
GEIST, ROBERT M.
HAMILTON, FRANK
HARTSON, L. D.
JARVIS, C. W.
KITCHIN, PAUL C.
LINDSEY, A. W.
MANUEL, WILLIAM A.
OSBORN, HERBERT
PATRICK, JAMES R.
PEATTIE, RODERICK
RAY, FRANCIS E.
ROTHEMUND, PAUL
SHANKLAND, R. S.
STOCKDALE, PARIS B.
TAFT, CLARENCE E.
THOMAS, EDWARD S.
VAN CLEEF, EUGENE
VISSCHER, J. PAUL
WALLER, A. E.
WILLIAMS, STEPHEN R.
WILLIAMSON, C. O.
WRIGHT, A. J.

REPORT OF THE FIFTY-FIRST ANNUAL MEETING OF THE OHIO ACADEMY OF SCIENCE

The fifty-first meeting of the Academy was held in Cleveland on May 8, 9 and 10, 1941. The local committee, under the chairmanship of Dr. J. Paul Visscher, planned sectional meetings in the Wade Park Manor Hotel, as well as the meeting of the council and the general meeting and banquet. Although the space available for sectional meetings was hardly adequate, the convenience of meeting under one roof was noteworthy, since the weather proved to be cold and rainy. The innovation is to be recommended where adequate space can be secured.

The general scientific meeting on Thursday evening, May 8, was also offered by the committee as an innovation. Dr. George M. Curtis, speaking on *Jared Potter Kirtland, Pioneer Naturalist of the Western Reserve,* and Dr. M. L. Pool on *Artificial Radio Activity and Its Application to Industrial and Medical Research,* contributed a most interesting program.

The Academy owes the local committee its gratitude for the pleasant setting of the meeting and for the facilities provided, as well as for the resources of the city that were made available to us.

At the meeting following the annual banquet, Dr. J. Paul Visscher, acting as toastmaster, presented Dr. William E. Wickenden of Case School of Applied Science and Dr. Webster G. Simon of Western Reserve University who spoke briefly to the assembled members. President Stephen R. Williams then read his presidential address, *The Saga of Paddy's Run,* an unusual contribution to the annals of the Academy but an interesting one, nevertheless.

In the business meeting following the banquet, Dr. Grover presented changes in the constitution as passed by the Council. The most momentous change dealt with Article XI, Section e, to permit the reversal of Council action by a majority vote of the members voting instead of the three-fourths formerly required. Another change established standing committees on necrology and resolutions in place of the former temporary appointments. The last change provided four year terms for Academy representatives on the Administrative Board of the Ohio Journal of Science, one representative to be elected every two years. The Academy duly adopted these changes.

Membership in the Academy was increased by twenty-eight, and the following members were elected to fellowship:

JOHN WARREN ALDRICH.....Western Reserve University
CONSTANTINE JOHN ALEXOPOULOS.....Kent State University
BERTIL G. ANDERSON.....Western Reserve University
FRANKLIN JAMES BACON.....Western Reserve University
MARION WATERMAN BOESEL.....Miami University
BENJAMIN P. BOLE, JR.....Cleveland Museum of Natural History
ARTHUR M. BRANT.....Ohio State University
ROBIN CHARLES BURRELL.....Ohio State University
DAVID CULBERTSON CHANDLER.....Stone Laboratory of Ohio State University
NORMAN F. CHILDERS.....Ohio State University
HARLA RAY EGGLESTON.....Marietta College
GEORGE MARION EHLERS.....University of Michigan
MORGAN WILLIAM EVANS.....Ohio Agricultural Experiment Station
ROSCOE WHITLOCK FRANKS.....Ohio State Civil Service Commission
WILLIAM FRANKLIN HAHNERT.....Ohio Wesleyan University
AUGUSTUS A. HALL.....Ohio State University
FRANK ERRETT HAMILTON.....Ohio State University
ARTHUR ROLAND HARPER.....Department of Education of Ohio, Columbus
FRANK O. HAZARD.....Wilmington College
EDWIN E. HEIZER.....University of Wisconsin
FREEMAN SMITH HOWLETT.....Ohio State University
CHARLES W. JARVIS.....Ohio Wesleyan University
CLYDE HAROLD JONES.....Ohio State University
GEORGE TALLMON JONES.....Oberlin College
JAMES BRIDGES LACKEY.....U. S. Public Health Service, Cincinnati
MILAN A. LOGAN.....University of Cincinnati
WILLARD MACHLE.....Kettering Laboratory, U. of Cincinnati
FRANCIS JOHN MOLZ.....University of Dayton
GEORGE DAVID MORGAN.....Denison University
DAVID C. RIFE.....Ohio State University
LEE STUART ROACH..Ohio Division of Conservation of Natural Resources, Athens
ALBERT RAY SHADLE.....University of Buffalo
RALPH V. SINNETT.....Ohio Wesleyan University
ARCHIE NORMAN SOLBERG.....University of Toledo
WALDO EDWARD STEIDTMANN.....Bowling Green State University
THOMAS C. SURRARRER.....Baldwin-Wallace College
ARAVILLA MEEK TAYLOR.....Lake Erie College
WILBUR METELLUS TIDD.....Ohio State University
WALTER ANDREWS TUCKER.....Columbus Dispatch
CARL ERNEST VENARD.....Ohio State University
CHARLES FREDERIC WALKER.....Stone Laboratory of Ohio State University
JOHN WEST WELLS.....Ohio State University
ARTHUR BALDWIN WILLIAMS.....Cleveland Museum of Natural History
ALFRED J. WRIGHT.....Ohio State University

The list of officers preceding this report shows the results of the election excepting one item. In presenting the report of the nominating committee Dr. Price suggested the name of Mr. William H. Alexander as historical secretary. Since this office is new, amendment of the constitution is required to create it. At the suggestion of several speakers Mr. Alexander was asked to act as historian until appropriate action could be taken to create such an office.

At this point action was taken on the committee for the revision of the constitution. The Academy voted to continue the committee of the past year under the chairmanship of Dr. Grover.

Dr. John G. Albright presented the report of the committee on Necrology and Dr. Edward W. E. Schear that of the Committee on Resolutions.

The meeting adjourned after brief discussion of several items of business of a less formal nature.

In presenting this brief report the secretary wishes to explain the delay in its presentation. The officers of several sections were not reported in the spring. Repeated inquiry failed to secure some of the names and in other cases no election had been held. At last, with the generous aid of President Van Cleef, the list was completed after the middle of September. Other peculiarities of the report must be laid to the fact that a change in secretaries itself causes some confusion.

Respectfully submitted,

A. W. LINDSEY, *Secretary.*

Report of the Treasurer

COLUMBUS, OHIO, May 9, 1941.

To the Ohio Academy of Science:

I submit herewith a financial statement of the condition of the Ohio Academy of Science as of December 31, 1940. The books have been audited and the opinion of the auditor is herewith attached.

Respectfully submitted,

EDWARD S. THOMAS, *Treasurer.*

BALANCE SHEET AS AT DECEMBER 31, 1940

Assets

CURRENT EXPENSE FUND:		
Cash in Bank—Current		$ 222.25
Cash in Bank—Semi-Centennial Celebration		607.40
Total Cash—Current Expense Fund (Schedule 1)		$ 829.65
Dues Receivable:		
1938	$ 10.00	
1939	60.00	
1940	362.50	
Total Dues Receivable		432.50
Interest Receivable (Bond coupons not cashed in 1940)		39.00
Bonds—Consolidated Federal Farm Loan 3 per cent 1945-55		1,300.00
Total Assets—Current Expense Fund		$2,601.15

RESEARCH FUND:		
Cash in Bank	$ 87.16	
Banc-Ohio Securities Company Stock (cost)	437.50	
Bonds—Fort Hayes Hotel, Columbus, Ohio (cost)	1,300.00	
Total Assets—Research Fund		1,824.66
Total Assets		$4,425.81

Liabilities, Deferred Credits and Net Worth

LIABILITIES:		
Accounts Payable		$ 260.61
DEFERRED CREDITS TO INCOME:		
Reserve for Uncollected Dues 1938, 1939 and 1940	$ 432.50	
1941 Dues Collected in 1940	20.00	
Total Deferred Credits to Income		452.50
Total Liabilities and Deferred Credits to Income		$ 713.11
NET WORTH:		
Ohio Academy of Science:		
Current Expense Fund Surplus	$1,378.25	
Semi-Centennial Celebration Surplus	509.79	
Research Fund Surplus	1,824.66	
Total Net Worth (Schedule 2)		3,712.70
Total Liabilities, Deferred Credits and Net Worth		$4,425.81

STATEMENT OF CASH RECEIPTS AND DISBURSEMENTS FOR THE YEAR ENDING DECEMBER 31, 1940

CASH BALANCE—DECEMBER 31, 1939:		
Ohio Academy of Science—Current Fund		$ 27.37
Semi-Centennial Celebration		100.00
Total Cash Balance—December 31, 1939 (as per books)		$ 127.37
DEPOSITS FOR THE YEAR:		
Ohio Academy of Science Receipts:		
Cash Received in 1939, Deposited in 1940	$ 2.50	
Dues 1940	1,197.40	
Dues 1939	55.00	
Dues 1938	22.50	
Dues 1941	20.00	
Research Grants	150.00	
Federal Farm Loan Coupons	19.50	
Sale of Publications	3.00	
Miscellaneous Income	1.00	
Total Deposits—Ohio Academy of Science		$1,470.90
Semi-Centennial Celebration:		
Cash Received in 1939 Deposited 1940	$150.00	
Receipts for 1940	796.80	
Total Deposits—Semi-Centennial Celebration	946.80	
Total Deposits for the Year		2,417.70
Total Balance and Receipts		$2,545.07

DISBURSEMENTS (Checks Written):		
Ohio Academy of Science:		
Clerical Assistance		$ 11.60
Postage and Telegraph		69.70
Office Supplies and Expense		15.45
Expenses of Officers to Meetings		72.17
Printing:		
Proceedings of Ohio Journal of Science	$ 65.00	
Other	35.67	
		100.67
Subscriptions to Ohio Journal of Science		675.00
Research Grants		150.00
Secretary's Honorarium		100.00
Safety Deposit Box		3.30
Bond for Treasurer		5.00
Auditing Expense		15.00
Bank Charges		5.13
Reported Proceedings Annual Meeting		27.00
Miscellaneous Expense		26.00
Total Disbursements—Ohio Academy of Science		$1,276.02
Semi-Centennial Celebration and Junior Academy:		
Stationery and Office Supplies	$ 25.35	
Postage	38.62	
Committee Expenses	147.78	
Printing	18.25	
Honorariums to Speakers	150.00	
Speakers' Traveling Expenses	46.90	
Publicity	12.50	
Total Disbursements—Semi-Centennial Celebration and Junior Academy		439.40
Total Disbursements		1,715.42
CASH BALANCE—December 31, 1940		$ 829.65
Distributed as follows:		
Ohio Academy of Science		$ 222.25
Semi-Centennial Celebration		607.40
Total		$ 829.65

NET CASH BALANCE AFTER CONSIDERING OBLIGATIONS AS AT DECEMBER 31, 1940

	Cash	*Accounts Payable*	*Net*
Ohio Academy of Science	$222.25	$163.00	$ 59.25
Semi-Centennial Celebration	607.40	97.61	509.79
Totals	$829.65	$260.61	$569.04

COLUMBUS, OHIO, July 8, 1941.

The Ohio Academy of Science, Columbus, Ohio.

GENTLEMEN:—In accordance with your instructions, I have audited the accounts and records of the Treasurer of the Ohio Academy of Science for the year ended December 31, 1940.

All cash receipts and disbursements of the current expense fund were checked in detail for the period under review.

Cash in the bank was verified by bank confirmation and reconcilement with the book balance.

Investment securities on hand December 31, 1940, in the current expense fund, were examined and found to be as stated in the accompanying balance sheet. Cash and investment securities of the research fund were not verified in the course of this examination.

Members' dues accounts were not verified by correspondence with the members.

I hereby certify that, in my opinion, the accompanying Balance Sheet as at December 31, 1940, and related statement of Income and Expense fairly present the financial condition of the Ohio Academy of Science and the results of operation for the year ended that date.

Respectfully yours,

DANIEL M. SHONTING,
Certified Public Accountant.

Report of Trustees of the Research Fund

The accounts of the Research Fund for the year 1940 and submitted for audit as of December 31, 1940, were as follows:

CREDITS

Balance January 1, 1940	$ 193.93
Deposits during 1940	74.00
Total Credits	$ 267.93

DEBITS

Paid on Grants for Research from Research Fund	$ 178.91
Service Charges at Bank	1.86
Total Debits	$ 180.77
Balance in checking account January 1, 1941	$ 87.16

The Invested Funds are the same as a year ago:

Bonds (at cost)	$1,300.00
Stocks Ohio National Bank (at cost)	437.50
Total	$1,737.50
Cash Balance in Checking Account	87.16
Total Assets	$1,824.66

The allotment from the A. A. A. S. for research projects for 1940, cleared through Treasurer's office, was assigned to Dr. Archie N. Solberg, Toledo Univ., $50.00, and Dr. J. W. Frink, Univ. of Cincinnati, $100.00, for projects approved by the Trustees and acceptable to the A. A. A. S.

Later additions and anticipated income for the current year will give us a free balance of over $150.00 and applications for grants during the current year will be welcomed.

The grant from the A. A. A. S. for research was increased to $175.00 for the present year and this will permit a larger allowance for research

projects in progress. Since the allowance from the A. A. A. S. is likely to continue it would seem that we may anticipate grants of at least $200.00 each year. It is expected that all of the allowance from the A. A. A. S. will be expended during each year.

Respectfully submitted,

HERBERT OSBORN, *Chairman*,
C. G. SHATZER,
PAUL B. SEARS.

Report of the Joint Administrative Board of the Ohio Journal of Science

COLUMBUS, OHIO, April 26, 1941.

To the Ohio Academy of Science:

The only meeting of the Joint Administrative Board of the *Ohio Journal of Science* since the last report was held at the Ohio State University, April 26, 1941. Present were Messrs. Patrick, Lindsey, Transeau, Blake, Snyder, Meyer, Blaydes, and Miller. The meeting was called to order about 12:30 P. M., Dr. Patrick acting as chairman. The minutes of the preceding meeting were read and approved.

Dr. L. H. Snyder was elected Editor, Dr. G. W. Blaydes, Associate Editor, and Dr. John A. Miller, Business Manager of the *Journal* for the coming year. Dr. Blaydes had been serving as Associate Editor since last November when he was elected to that position by a mail ballot of the Board. Dr. Snyder's resignation, effective at the end of the coming year, was accepted with regrets. Dr. Meyer had advised the Board at its last meeting that he would not accept re-election as Business Manager for another year.

The Business Manager presented his report for the fiscal year 1939, as follows:

RECEIPTS

Balance from 1939	$ 35.98
University Allowance	750.00
Ohio Academy of Science—pro rata of dues	821.00
Subscriptions	125.06
Author's payments for plates	114.17
Sale of back numbers	19.89
Cleveland Clinic—Publication costs	160.00
Total	$2,026.10

EXPENDITURES

Spahr & Glenn Printing Vol. 40	$1,593.80
Bucher Engraving Company	195.80
Postmaster	122.00
Envelopes and stationery	36.90
Clerical assistance	7.50
Subscription refund	1.67
Bank charges	1.07
Total	$1,958.74
Balance on hand March 13, 1941 (Huntington National Bank)	67.36
	$2,026.10

Upon motion the report was accepted and placed on file. An auditing committee consisting of Dr. Transeau and Dr. Blaydes, found the report to be correct.

The Business Manager advised the Board of his action in deferring the mailing of foreign exchanges during present war conditions.

There was some informal discussion regarding the problems involved in publishing the 50th Anniversary number of the *Journal* and regarding the organization of the Board, but no formal actions were taken.

The meeting adjourned at about 2:00 P. M.

Respectfully submitted,
B. S. MEYER, *Secretary of the Board.*

Report of the Library Committee

COLUMBUS, OHIO, May 9, 1941.

To the Council of the Ohio Academy of Science:

The library committee has had no conferences and no correspondence this year.

The sales of publications amounted to $10.05. This sum plus six cents sales tax has been given to the Treasurer. A few Annual Reports were sold and ten Special Papers, half of which were Dr. W. G. Stover's Agaricaceae of Ohio. An order for a dozen copies of this paper has been received this year from Ohio University. This will appear in next year's report and will likely lead the list again in number of copies sold.

Last summer the mailing room at the Ohio State University obtained a new addressograph machine and made entirely new sets of stencils for the thirty or forty thousand names in its files including the members of the Ohio Academy of Science. The type is much larger and more easily read than were the former addresses. The new set of Academy cards was checked with the old set and a number of errors were found and corrected.

Several new exchanges have been added to the list. We now have 110 in this country and 272 abroad. Some of the foreign exchanges have come regularly during the past year, others intermittently and of course some not at all. More have come in the last few weeks than for several months. The first number of a new geography periodical in Spain was received recently with a request for exchange. No issues of our own *Ohio Journal of Science* have been sent this year to any place outside the Western Hemisphere. In January the Business Manager sent postal cards to the exchanges stating that all issues would be held here until a later time unless the recipient wished them sent at his own risk. So far no replies have been received.

The memorial volume in honor of the fiftieth anniversary of the founding of the Academy was the most important undertaking of the past year. Some of the members thought that it would be very appropriate to publish the pictures of the men and women who organized it and the chairman of this committee was asked to get them. Securing these pictures was a large and interesting piece of work and the history of it constitutes a large part of this report. The size of the task can be

imagined when one considers that I had a list of fifty-nine names with their addresses of fifty years ago. I knew that six were still living and that several had relatives in Columbus. Dr. Herbert Osborn and Dr. William L. Evans were very helpful in giving suggestions about possible sources. However there were no clues whatever for twenty-four names.

The next question to be settled was how to get the pictures copied when they should come. I asked Dr. Raymond C. Osburn if the photographer in the Zoology Department of the Ohio State University might be permitted to do the work. He agreed readily, stating that he thought that his department could well make that contribution to the Ohio Academy of Science.

Having thus disposed of the preface I was ready for the first chapter in the story of the pictures. I started with the most probable ones. When asking for the loan of a picture I always stated that it would be copied by the photographer in our building and would be returned promptly. The response was most gratifying. Everyone seemed much pleased that the pictures were to be published, many expressed a desire for a copy of the volume, and some said that they wished to purchase one or more copies. When the pictures were returned to the owners a small print was always enclosed, which seemed to be appreciated by the recipient. Much credit is due to the photographer, Mr. Louis Waszy, for his prompt and efficient work in making the negatives and prints.

After writing for all the probable ones I started on those for which I had no clues and it was very interesting to see how clues were found in the most unexpected places. There is an interesting story connected with nearly every picture. I usually began with the public library of the town where the person had lived in 1890 or at a later date if I could learn such. And without exception the librarians were most accommodating and helpful. Many pictures could not have been secured if they had not given the assistance which they did, for they either obtained the actual pictures and sent them to me or else they furnished good clues as to where I might succeed in locating them. They are Miss Gertrude Robertson of the Cleveland Public Library, Mr. W. J. Hamilton, Dayton; Mrs. Viola C. Marlatt, Defiance; Miss Florence L. Irwin, Geneva; Miss Jennie A. Shuman, Kent; Mrs. Ruth H. Pierce, Painesville; Mrs. F. W. Moulton, Portsmouth; and Miss Mary McCann of the Sandusky Public Library; Miss Eleanor S. Wilby of the Historical and Philosophical Society of Ohio, and Mrs. Corinne M. Simons of the Lloyd Library, both at Cincinnati. Also the same assistance was given by college librarians, Mr. Deckard Ritter of Ohio Wesleyan; Mr. R. E. Stauffer of Mt. Union; and Miss Marguerite Mitchell of Wilmington; by Dr. Byron H. Nellans, Dean of the Eclectic Medical College at Cincinnati; by various professors at Akron, Heidelberg, Mt. Union, Miami, Oberlin, Ohio University, Ohio Wesleyan, and Ohio State; by Mr. James D. Hartshorne of the Cleveland *Plain Dealer;* by Mr. C. W. Parrott, Vice-President of The Lowe Brothers Paint Company at Dayton; and by the Good Samaritan Hospital at Zanesville. All of these deserve much credit for the interest they took and the efforts which they made.

As a last resort I took the Columbus telephone directory and phoned to the people with the same name, asking if they were by any chance related to the person in question. Two pictures were secured in this way.

The Secretary of the Academy had offered to write to the six living members: Mr. J. N. Bradford of Columbus, Dr. E. G. Conklin of Princeton, Dr. C. B. Morrey and Dr. George W. Twiss of Florida, Professor E. L. Moseley of Bowling Green, and Dr. A. L. Treadwell of Vassar College. During my search for pictures I learned of three more: L. M. Bloomfield, a former professor at Ohio State University, who lives near Lancaster; G. P. Grimsley, who recently retired from many years' service in the offices of the Baltimore and Ohio Railroad at Baltimore; and H. A. Surface, former State Zoologist of Pennsylvania, who lives or winters in Florida. (I have just learned during September that Mr. Lucius A. Hine is living in Highland Park, Illinois.) Thus ten of the fifty-nine original charter members are still living.

I succeeded in obtaining fifty-six of the fifty-nine pictures. One seems to be wholly non-existent, that of Mr. L. W. Gunckel of Dayton, and so far I have failed to get one of Mr. Frank J. Combs of Columbus, and of Professor Ellen E. Smith of Lake Erie College, Painesville, who was one of the two vice-presidents when the Academy was organized and who died a year or so later, in 1893 or 1894. Pictures came from twenty places in Ohio, as follows, twenty-one from Columbus, three each from Cincinnati and Cleveland, two from Delaware, and one each from Adams Mills, Akron, Alliance, Bowling Green, Chillicothe, Cuyahoga Falls, Dayton, Geneva, Granville, Lancaster, Oberlin, Oxford, Painesville, Sandusky, Tiffin, and Wilmington. Four came from Florida, from Ft. Myers, South Miami, Vero Beach, and Zephyrhills, and one each from Baltimore, Chevy Chase, Chicago, Minneapolis, Philadelphia, Poughkeepsie, and Washington, D. C. They were secured directly from the living members, and from the widows, sons, daughters, granddaughter, sisters, nieces, cousins, and brother-in-law of the other members, from college collections of pictures, and from books, for in a few cases no separate picture could be located.

From one to eleven letters were required for each picture. The eleven were in regard to Miss Jane F. Winn, a vice-president in 1895. Her case seemed almost hopeless but finally the picture came very unexpectedly from a friend of hers in Chicago, with an interesting sketch of her life. Quite a number of biographies were sent with the various pictures to be kept in the files of the Academy, if not published.

The results to date show that one hundred and forty-nine letters and twenty postal cards were written, numerous telephone calls were made, and sixteen trips were taken in Columbus to get and to return pictures. These figures do not include the number of letters which were written by the Secretary to the living members. The postage on the letters, cards, and parcels of pictures amounted to six dollars which was paid by the Ohio State University Library. Four of the pictures had to be purchased as they were available only at photographic studios. The prices were fifty cents, one dollar and two dollars each but as I was able to sell the last one for a dollar the total cost to the Academy for the four pictures was $4.50. So the actual cash outlay has been $10.50. In

addition the Zoology Department of the Ohio State University furnished all the material for the negatives and prints, as well as the time of its photographer.

The entire project has taken much work and time. From September 26, 1940, when the first letters were written until January 7, 1941, when the last borrowed pictures were returned, the search for them consumed practically my entire time. Nearly everything else was either laid aside or handed over to my assistant. However, everyone co-operated so well and seemed so pleased that the pictures were wanted and were to be published in permanent form that it really was a very interesting task. There was always great satisfaction when a picture was received.

And now comes the next chapter in the story of these pictures. After securing them on the basis that they were to be published, the statement was made to me that there were no funds with which to do it, that there would be no memorial volume but that only the invitational addresses would be published in the May issue of the *Ohio Journal of Science.* I was much dismayed for I feel that we are under a moral obligation to all these people who sent pictures so willingly and gladly on the basis of their publication. They would make not more than seven plates and the cost would be between six and eight dollars a plate on the basis of a thousand copies. They could very well accompany the address on the history of the Ohio Academy of Science which was given by Dr. J. P. Porter last year. It would seem that the fiftieth anniversary should not be passed without the recording of its history in printed form.

Thus the final chapter to the story of the pictures has not yet been written. What it will be depends upon the action of the Academy. If it can find it possible to supply the fifty or sixty dollars necessary to publish them our obligation to the owners of these pictures can be fulfilled and the Academy will have a permanent record of its fifty-year history and of the men and women who organized it. On the other hand if the Academy be unable to see its way to appropriating this sum I shall be obliged to write about fifty more letters, stating that I regret it exceedingly but that it has not been found possible to publish them. Shall the story of the pictures have this kind of an ending as its last chapter or can we keep the pledges made to the owners of the pictures and thus give a happy ending to the story? May the Council decide.

Respectfully submitted,

ETHEL MELSHEIMER MILLER, *Chairman.*

EDITOR'S NOTE: The pictures of which Mrs. Miller speaks were published in the July, 1941 issue of the Ohio Journal of Science.

Report of Committee on Resolutions

Resolutions of this, the fifty-first meeting of the Ohio Academy of Science and fourth Cleveland meeting:

The Committee on Resolutions recommends that we express our appreciation for the very cordial reception we have received from our

distinguished hosts, Western Reserve University and the Case School of Applied Science.

The precision with which the plans were formulated and have been and are being carried through are distinctly noteworthy and the fine spirit of co-operation on the part of the Wade Park Manor and the Convention Bureau of the Cleveland Chamber of Commerce is deserving special recognition.

The cultural atmosphere, the cordial co-operation on the part of the museums, the work of the entertainment committee in providing for the excursions and other features have made this meeting one long to be remembered by both members and guests.

Respectfully submitted,

RALPH V. BANGHAM,
H. RAY EGGLESTON,
EDWARD W. E. SCHEAR, *Chairman.*

Report of the Committee on Necrology

CLEVELAND, OHIO, May 9, 1941.

To the Ohio Academy of Science:

Notice of the death of four members of the Academy has come to the attention of your committee. The names are those of Dr. Maynard M. Metcalf, Dr. B. C. Freeman, Dr. Dayton C. Miller, and Dr. Francis H. Herrick. A short account of the life and work of each man follows:

MAYNARD M. METCALF

Dr. Metcalf was the retired Research Professor of Zoology of the Johns Hopkins University. He was born in Elyria, Ohio, in 1868, the son of Elijah Wright Metcalf and Maria Ely Metcalf. He was educated at Oberlin College and Johns Hopkins University, receiving the Ph. D. degree from the latter institution in 1893. He was Chairman of the Biology Department of Goucher College until 1906, when he became head of the Zoology Department of Oberlin College. In 1914 Dr. Metcalf resigned from college work to devote his time to research in the field. He worked both in this country and abroad. In 1924 he was Chairman of the Division of Biology and Agriculture of the National Research Council.

Dr. Metcalf was a member of the Ohio Academy of Science, and was its President in 1919. He had been a Trustee from 1913 to 1917. His published works numbered more than 150, dealing mostly with evolution, sociology, economics and philosophy. He died in Winter Park, Florida, April 22, 1940.

BRUCE CLARK FREEMAN

Dr. Freeman was a member of the Geology Department at the Ohio State University. He died August 25, 1940, in his sleep, while on a geological field trip for the Quebec Bureau of Mines. He was about 40 years of age.

Dayton C. Miller

Dr. Dayton C. Miller, distinguished scientist and teacher, died at his home in Cleveland on February 22, 1941. He was born in Strongsville, Ohio, on March 13, 1866. He received the B. S. and M. S. degrees from Baldwin-Wallace College, and the Doctorate of Science from Princeton University (1890). His first position was as instructor of mathematics and physics at the Case School of Applied Science, and he remained on the faculty for fifty years, rising through the rank of assistant professor to the head professorship of physics. He retired from active duty in June, 1940. He was responsible for the plans and construction of the Rockefeller Laboratory of Physics at Case. His chief work was done in the field of acoustics. He invented the phonodeik, which made visible the complex wave-forms of sound waves, and amplified them several thousand times. His consultation was frequently asked in the improvement of the acoustical qualities of large auditoriums. Among his notable researches were those concerning the tone qualities of musical instruments. He was a lover of music, and composed about thirty pieces of music for the piano, the flute and other musical instruments. Among his works are eight published books.

He was a member of the National Academy of Sciences as well as many other scientific organizations. He received at various times five honorary doctor's degrees. He was an inspiring teacher and a most productive research worker.

Francis Hobart Herrick

Dr. Herrick was born in Woodstock, Vermont, on November 19, 1858. He died in Cleveland on September 11, 1940. He received his formal education at St. Paul's School, Concord, N. H., graduated from Dartmouth College in 1881, and received the Ph. D. degree from Johns Hopkins University in 1888. He was Professor of Biology at Western Reserve University from 1888 until he became Professor Emeritus in 1929. He was known throughout the world for his work on the embryology and life history of Crustacea, especially the lobster. Outstanding was his definitive biography of the famous naturalist John James Audubon. In later years he conducted his well-known ornithological studies on the American Eagle.

Respectfully submitted,

John G. Albright, *Chairman.*

AUTHORS' ABSTRACTS AND BRIEF ARTICLES

A. THE SECTION OF ZOOLOGY

Courses of the Bald Faced Hornet (Dolichovespula Maculata)—By KELLEY HALE, Wilmington, Ohio.

In July, 1940, Nathan Hale discovered a queen's nest in the early stage of construction attached to the underside of the terra cotta above the entrance to Hale Surgical Hospital.

Daily photographs with 35 mm. Kodachrome were made through a 135 mm. telephoto lens mounted on a miniature camera until activity of the colony ceased in November, 1940.

It was soon discovered that the workers were using similar courses, some being quite complex due to large trees and buildings. Fourteen courses had been established and maintained throughout the season.

I quote from a letter received from Dr. Carl D. Duncan of San Jose State College, author of a fine book on the Vespena:

"On various occasions I have noted that wasps follow fairly definite courses in leaving and returning to their nests. However I do not know of anyone who has carefully observed such behavior for any length of time and published the results of his observations. It may be therefore, that you have collected data that are worthy of publication."

Suggested plan for solution of course problem of bald faced hornet:

1. Note carefully the courses followed by the queen during construction of the queen's nest.

2. Observe if the subsequent courses of the workers coincide or not with those of the queen. I am anxious to hear from as many observers as possible on this particular point.

3. I am desirous to know if each worker follows a particular course or is shifted from one course to another. To solve this point we could do the following experiments:

(a) Mark all the workers on a particular course dusting or spraying to see if they change courses.

(b) Net all the workers of a certain course and keep them in captivity long enough to see if others take their place. When released they should be marked for identification.

(c) Kill all the workers of a course with mustard shot.

(d) Kidnap the workers of a particular course and at a distance turn them loose at different times and points of the compass (after marking) and see how many return and by which routes.

(e) See if a hornet can return to the nest from a nearby point in its course after painting its eyes with an opaque substance.

(f) Disorient the nest if attached to a twig that can be removed.

4. If the queen does not lay out the courses perhaps the first brood does; if so, how do the subsequent or future workers learn the course or courses so well?

Since no published observations have been made on identical courses of Bald Faced hornets so far as I can learn, I am offering this paper

hoping to stimulate further work and experiments on this most intriguing subject.

I learned that it is a common belief that hornet nests are used more than one season. With rare exceptions this is not true.

B. THE SECTION OF BOTANY

Are the Green Algae Ancestral to the Embryophyta:—By GEORGE T. JONES, Oberlin College, Oberlin, Ohio.

Three primary objections to the theory that land plants arose from the Chlorophyceae are presented: (1) the ecological objection that a small green thallus adjusted to aquatic life would not be likely to survive if stranded on an unshaded beach; (2) it is contrary to all other experience that a complete parasite, such as the Riccia sporophyte, should develop autonomy; and (3) the necessary assumption that Riccia is primitive is not justified by the evidence of sequence of forms within the class Hepaticae itself. An alternative theory is proposed that the Embryophyta is more closely related to the Phaeophyceae than to any other group of living algae. Similarity of general form, identical modes of increase in size, ability to withstand drying, the occurrence of sieve tubes in both, multilocular gametangia, alternation of unequal generations, and the possibility of migration to terrestrial habitats through brackish marshes are cited as arguments in favor of the latter theory. The Pteridophytes and Phaeophyceae would both arise from a common stock, having alternation of equal generations, the former becoming terrestrial and the latter remaining marine. The Bryophyta would diverge from the most primitive Pteridophytes through reductive adaptation to an understory habit.

Water-Loss in Relation to Leaf Structure in American Holly, Tobacco, and Coleus:—By C. A. SWANSON, Ohio State University, Columbus, Ohio.

Simultaneous determinations of the rate of water-loss in potted plants of *Ilex opaca, Nicotiana sp.*, and *Coleus blumeii* were made under the same environmental conditions. Despite the very thick cuticle and other "xeromorphic" peculiarities of holly leaves, the rate of transpiration per sq. dm. of lower leaf surface in this species was generally higher than in the other two species.

Growth Habits of Reed Canary Grass:—By MORGAN W. EVANS and J. ELBERT ELY (deceased), Ohio Agricultural Experiment Station, Wooster, Ohio.

The underground rooting stems or rhizomes of reed canary grass (*Phalaris arundinacea* L.) originate chiefly during May, June, July, and August. Above-ground shoots develop in largest numbers during fall and early spring. In the latitude of northern Ohio, culms, with their elongated internodes, begin to form about or soon after the middle

of April. The proportion of shoots producing inflorescences increases with improved cultural conditions. Shoots which begin their growth in the spring and summer are not winter hardy, and their life is limited to the same season. The life of a shoot which develops in the fall is limited to the growing season of the following year.

In the latitude of northern Ohio, inflorescences begin to develop from the growing points of the shoots about or very soon after the middle of April; flowering begins in early June; seeds mature in late June and early July. Flowering and maturing gradually progress from just below the tip of the inflorescence toward its base. The leaves of reed canary grass are destroyed by temperatures not low enough to destroy the leaves of timothy, redtop, or Kentucky bluegrass.

The American Species of Micrasterias:—By R. K. SALISBURY, Greenhills, Cincinnati.

The author has found twenty-two species, thirteen varieties, two forms of Micrasterias in Florida. Krieger (1939) has listed fifty-six (56) species and one hundred thirty-six (136) varieties for the world, of which thirty-three (33) species and thirty-seven (37) varieties are given for the United States.

Forms of *M. radiata* not heretofore published and a new variety of *M. sol* were shown.

M. radiata is very variable and appears to show characteristics of other species with which it is found. The validity of certain varieties established on the basis of spines is questioned.

Morphological Variations of Rhizopus Suinus Niels. Under Various Physiological Conditions:—By C. J. CORUM, Western Reserve University, Cleveland, Ohio.

Continued sub-culture of *Rhizopus suinus* for a period of thirty months upon a synthetic nutrient agar medium resulted in gradual diminution in ability of the organism to produce spores. Finally a stage was reached in which there was no sporulation whatever, the mycelial mat produced being a pure white color.

In the weakly-sporing cultures several types of abnormalities were observed, viz.: peculiar bulbous hyphal enlargements, highly branched sporangiophores, great variations in size of sporangia and spores, and incomplete cleavage in some sporangia—all indications of an abnormal condition of the cultures. Other abnormal growths found in the sterile cultures were an extensive irregular branching of the hyphae, and an abundant occurrence of chlamydospores from which short germ tubes were frequently seen to protrude.

Restoration of the spore-forming ability of the cultures could be accomplished by growing the fungus on potato dextrose agar or on a synthetic agar to which thiamin had been added. The cultures could be returned rather rapidly to the non-sporulating condition by growing the fungus on a synthetic medium, using as a carbon source dextrose that had been extracted with acetone, alcohol, and ether to remove the thiamin.

The Forest Situation in Ohio:—By OLIVER D. DILLER, Ohio Agricultural Experiment Station, Wooster, Ohio.

Ohio has two distinct forest problems. In the hilly, southeastern, one-third where the timber tracts are relatively large, there are vast areas of worn out land where fire, overcutting, and soil erosion have depleted the soil, and lowered the standard of living. The greatest rural relief load is here.

In the level two-thirds the woodlands are in small, scattered patches, which total three and a quarter million acres, give the highest quality timber, and in spite of neglect produce an annual income of about four million dollars, or slightly over one dollar an acre. This is only about one tenth of the income that could be obtained under proper handling.

The problems of re-establishing forest cover by forest planting, and of properly protecting and managing the existing woodlands to produce a sustained yield of the higher grade timbers were discussed and illustrated. The need of adequate appropriations from the state legislature for carrying out a long time forest program was emphasized.

C. THE SECTION OF GEOLOGY

The Fauna and Stratigraphic Relationships of the Prout Limestone and Plum Brook Shale of Northern Ohio:—By ERWIN C. STUMM, Department of Geology, Oberlin College, Oberlin, Ohio.

The Prout limestone with its predominant coral and brachiopod fauna is correlated with the Centerfield limestone of the New York Hamilton. The guide fossils of this horizon with special mention of the brachiopods *"Spirifer" venustus*, *Camarophoria kernahani*, *Eunella attenuata*, and *Pentagonia bicostata*, are discussed. The underlying Plum Brook shale is correlated with the Skaneateles. The fossils of both formations are illustrated on five plates.

*Pseudo-Algal Nodules in the Greenfield Dolomite (Silurian of Ohio).*By JOHN W. WELLS, Department of Geology, Ohio State University, Columbus, Ohio.

The nodules found in the Greenfield dolomite at its type locality near Greenfield, Ohio, show no trace of structures attributable either directly or indirectly to algae and they are thought to be the result of physico-chemical deposition.

Stylolites—Primary or Secondary?—By PARIS B. STOCKDALE, Department of Geology, Ohio State University, Columbus, Ohio.

After surviving nearly two decades of general acceptance by American geologists, the solution theory for the origin of stylolites is being further studied in light of the substitute "contraction-pressure" theory

recently proposed by B. M. Shaub. According to the new theory stylolites are a *primary* structure which originated while sediments were in the unconsolidated state from differential pressure and contraction which compelled "transfer of material by plastic flow." The solution theory holds that stylolites are a *secondary* phenomenon developed after consolidation and hardening of strata through rock removal by differential chemical solution. The preponderance of field evidence along many lines shows that stylolite-making has involved removal of rock material after lithification of the sediments. A recently discovered occurrence of large and well-defined stylolites in sharply laminated limestone gives no evidence of readjustment or reshaping of sediments through differential squeezing or flow. The stylolites are of secondary origin and give further support to the solution theory.

The Relation of Geology and Physiographic History to Floods in the Muskingum Valley:—By H. ANDREW IRELAND, Soil Conservation Service, New Philadelphia, Ohio.

The Muskingum valley has a complex physiographic history brought about by several cycles of preglacial erosion, Pleistocene erosion, and glaciation. Quantitative evidence is given to show that soils, outwash gravel, and the more gentle slopes of glaciated areas allow absorption of a large amount of precipitation and large ground water storage results. The ground water is fed into the streams maintaining a large flow even during dry seasons. The gravel fill in the entrenched valleys of the Deep Stage has much more storage space than similar valleys filled with slack-water silt. Depletion curves, run-off graphs, and measurement of ground water accretion to stream flow are used as evidence of differential absorption. Differences are explained on the basis of geologic and physiographic conditions. The effect of drainage patterns inherited from preglacial systems and drainage changes due to glaciation are interpreted in regard to their effect on floods.

Relation of Soil-Creep to Earthflow in Eastern Ohio:—By C. F. STEWART SHARPE and EARL F. DOSCH, U. S. Soil Conservation Service, New Philadelphia, Ohio.

Recent studies of soil movements on agricultural lands in parts of the Appalachian Plateau underlain by Pennsylvanian and Permian rocks containing numerous coals, clays, and shales reveal that the widespread slow process of soil-creep prepares the way for the localized and much faster earthflow.

On a typical hill slope in this area only the most massive beds of rock are exposed; the position of the weaker beds is obscured by a mantle of soil and rock debris. Road cuts and deep auger borings show that horizontal beds of coal, clay, and shale, instead of outcropping, thin abruptly and bend down slope several feet below the surface and may be traced down the hillside in attenuated form for as much as 200 feet. A clay or shale layer thus drawn out parallel to the slope interferes with downward percolation of surface water and of ground water that has moved laterally outward above the undisturbed clay stratum.

During and following heavy precipitation the more or less impervious blanket of creeping clay locally brings about saturation of overlying material, and, on moderate or steep slopes with insufficient vegetal cover to retain the soil, an earthflow may result.

Down-stream Narrowing of the Valley Floors of Lower Cuyahoga and Rocky Rivers:—By HENRY F. DONNER, Western Reserve University, Cleveland, Ohio.

In the lower six or eight miles of their courses, Cuyahoga River has cut into unconsolidated, glacial material whereas Rocky River has cut almost entirely into bedrock. For the last two and one-half miles both rivers seem to be in an earlier stage of physiographic development than they are farther up-stream. Difference in material along the valley is a minor cause, except in Rocky River where the valley cuts across the filled-in, preglacial channel. Evidence indicates that Big Creek may have entered Cuyahoga River some two miles farther down stream at an earlier stage. Both streams widened their valleys along their parallel courses until the divide separating them was removed. This, in part, may explain the wide portion of Cuyahoga Valley extending from Big Creek to a point about two miles north.

A general cause, affecting both rivers, was the repeated changing of the lake level. At any particular lake stage the stream entering it developed a somewhat winding course. As the lake dropped to a new level the old, winding course persisted but the portion connecting the old shore line with the new took a more direct course. Lateral cutting was greater in the winding parts than in the straight ones; hence these upper valleys were widened more rapidly than the lower ones.

*An Unusual Landslide**:—By ROBERT H. MITCHELL, Muskingum College, New Concord, Ohio.

An unusual type of mass-movement occurred in a road cut near Zanesville, Ohio. In this slide the movement was largely horizontal, producing a "pseudo-graben" at the head of the slip. This condition is of interest since only normal slipping occurred on the opposite side of the road-cut under apparently similar conditions. Since the factors which favor mass-movement were present on both sides of the road-cut the different effects noted on opposite sides of the road must be due to varying combinations of the governing factors.

*This article will appear soon in the Journal of Geology.